

1 them in those areas.

2 Even with no communications at all, public
3 safety is going to respond, it's going to execute the
4 mission. But I hope that the great effort that the
5 Admiral's staff has done, the Admiral and his staff,
6 will help these public safety first responders do
7 their job that much better. It's been hammered here
8 and I'll hammer it again, coverage. Not just cities
9 but also those rural park, tribal, maritime,
10 wilderness areas. And affordable, a lot of these
11 agencies are very small.

12 I have an instance in my state where the
13 officers pay for their own data access out of their
14 own pocket. That's just not acceptable. And we need
15 it now. Existing systems that are out there that some
16 of us have are very low data rate. Give you an
17 example, the system I live this right now in North
18 Carolina, it's 10 kilobits per officer in a county.
19 All the officers share that same 10 kilobits.

20 We need the throughput, and I won't bang
21 that too hard, the other gentleman here will certainly
22 hit that, but I like what I hear. Interoperability,
23 we must have it, and we need to have the coverage
24 beyond geopolitical boundaries. The day of this
25 police chief saying, I don't like the sheriff, that's

1 fortunately gone away to a large extent, because
2 incidents and events do cross to boundaries.

3 IP and application rate control, everybody
4 here agrees to that, and it needs to be secure. I
5 like what I've seen for reliability, I won't go into
6 it any more, I mean other folks will, but public
7 safety needs the most reliable system it can get. And
8 although this won't be as well received, based on what
9 the mission that we're executing today, data and
10 pictures are more important than voice and video for
11 this system.

12 Not to say that voice and video isn't
13 something we want, we do, but I'm very guarded about
14 how much data and where I can get it out in rural
15 areas. So I've got voice systems that we are going to
16 keep, we are going to fall back on, so the issues of
17 being able to get some data and some pictures
18 certainly means a lot to my officers and the other
19 first responders that I work with. And I like what I
20 hear about coverage in rural areas so I won't beat on
21 that drum too much more.

22 I think these are motherhood and apple pie,
23 it means that the responders with the data
24 capabilities will spend more time in the field instead
25 of in offices which are the places that they have data

1 in many cases today. They will be able to communicate
2 across all jurisdictions and levels, execute the
3 mission faster, make better decisions, and have more
4 reliable and secure communications. So again, I'm
5 going to beat the clock by a good amount. I want to
6 just say thank you to the FCC and to the Public Safety
7 and Homeland Security Bureau, the Admiral and his
8 staff, for this opportunity.

9 And I will say in the two hours of this
10 group's meeting, public safety will have answered
11 almost 50,000 911 calls. That's not the total number
12 of calls, that's 911 calls. The mission is what it's
13 all about, and I hope, you know, that we will stay
14 focused on that mission, that secure interoperable
15 mobile wireless broadband would help public safety
16 respond to those calls, and that ultimately that data
17 is increasingly becoming of interest, so public safety
18 will benefit with the increased attention paid to
19 interoperable wireless broadband data communications,
20 not just voice. Thank you.

21 MR. KNAPP: Thank you, Allan. We're going
22 to hold the questions until after all of the
23 presentations. Robert?

24 MR. LEGRANDE: Thank you. So do I get his
25 five minutes? I just want to know.

1 MR. KNAPP: Only if he yields.

2 (Laughter.)

3 MR. LEGRANDE: Okay. We're partners, he
4 yielded. Okay, so first before I begin I just wanted
5 to thank Jamie, Jennifer, Stagg, and I'm looking over
6 here, John -- you see the ADD, I'm going in both
7 directions here. Really, guys, you've done a great
8 job with this plan, and I can say that sincerely. And
9 I also want to compliment you on the meeting we had
10 last Tuesday, it was spirited but it was necessary,
11 and I'll say it was one of the best FCC meetings I've
12 ever had, because you gave us an opportunity to really
13 dig into you -- no, I'm sorry -- just dig into your
14 plan, and I think that that was important for us to be
15 able to do that.

16 The comments today I represent are going to
17 be representing APCO's position, and I thank APCO for
18 allowing me to give that. So let's move to the next
19 slide. Oh, I just shut this thing off, can we stop?
20 Okay, I've done something to this and I don't know
21 what I've done. Okay, good. All right, thank you.
22 First I just want to talk about the vision. Everyone
23 shares the vision, which is a national interoperable
24 broadband network that involves seamlessly
25 interoperable networks throughout the country.

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1 I've taken that vision and I've broken it
2 down into various color coding to help present the
3 presentation today, and I want to draw your attention
4 to the amount of green on this chart. On education,
5 training, standards, the goal, funding, research and
6 development, operational procedures and exercises, and
7 the ruggedized devices, as I'll talk about in a
8 second, that plan and the plan that you guys are
9 promoting is in the right direction, and we're very
10 happy with that, and we're going to partner with you
11 to the extent that we can to help you promote those
12 things.

13 Now, obviously, you know, no plan ever is
14 perfect, and I wish it were, quite frankly I'd love to
15 see all of this was green, but there are some areas of
16 concern which I'm going to highlight today as well.
17 Let's move to the second chart. So first the good
18 news, all the great news I should say. Leverage
19 networks. You know, there's a lot of emphasis, Stagg,
20 and I want to talk about this a little bit later, on
21 commercial infrastructure.

22 Now, public safety has a lot of existing
23 infrastructure, millions of dollars, particularly
24 after 9/11, has been spent in infrastructure that they
25 can take advantage of that was already hardened. And

1 so I'd like to talk a little bit about that later on
2 because some of what I'm hearing right now puts a lot
3 of emphasis on the commercial carriers, which it
4 should be, but I think we should also make sure we put
5 the right emphasis on the existing state and local
6 jurisdictions' infrastructure. But the plan's right
7 on, it gives the flexibility to do that and we think
8 that's right.

9 Funding. Well, let's just start and stop
10 here. I mean the focus that you guys have put on
11 funding is dead on, and thank you for that. And I
12 think I can speak for APCO to say that we
13 wholeheartedly support that effort. We're going to
14 support the effort whether it's here, whether it's on
15 the Hill or wherever we have to go, because we all
16 know that none of this will work without funding. So
17 that's a very important thing.

18 Now, obviously you've put a lot of emphasis
19 on technical and operational standards. Those are
20 very important. The technical standards, certainly we
21 embrace LTE, and we would like to promote that and
22 move that forward to an official standard, but we also
23 need to get the operational standard. Keep in mind,
24 gentlemen, it's a new world order, voice video and
25 data, never done before, never be done over a single

1 network, and we need to have corresponding operational
2 procedures that go along with that. But your emphasis
3 throughout the plan on that is great.

4 Voice communications, as I just mentioned
5 voice, video, and data coming together, it's very
6 important that we have a migration path as a part of
7 the plan that shows how we get from voice, we just
8 don't jump from voice to broadband but we migrate to
9 broadband. Ubiquitous national public safety network,
10 while obviously a network of networks with operational
11 and technical standards that are shared across will
12 get us there, with the investment.

13 Ruggedized voice, video, and data devices,
14 truer words could not be spoken, I gave a lot of
15 emphasis on that when we were out in Vegas last week
16 because that's a very important part of achieving this
17 goal is making sure that we have the right devices to
18 do it. So on the issue of spectrum, well, let's just
19 start with we know that the spectrum fight is on
20 Capitol Hill. So let's just, you know, I'm not going
21 to go into a whole lot of what, when, and why.

22 I've obviously had to represent here why
23 public safety's position continues to be that we need
24 the spectrum, you know, and we've outlined that in a
25 website, it's d-block.net, and it goes into a lot of

1 detail on why we feel we need the spectrum. So but we
2 recognize that you guys' hands are tied to legislation
3 and we're actively working with folks on the Hill to
4 deal with that. Now, we hope to have hearings and we
5 hope to continue to dialogue with you guys in the
6 process. But as far as the spectrum, it's red because
7 it's something that we have to deal with on the Hill.

8 Roaming, priority, and preemption, we had a
9 lot of discussions about this in Vegas. The short
10 answer is that we're a little bit concerned that the
11 spectrum calculations place too heavy of a dependence
12 on our ability to roam on the commercial network.
13 Keep in mind that we've never done this before. And
14 because we've never done it before, we're going to
15 move to a public safety setting where we have lives in
16 our hands.

17 So we really want to be careful with that,
18 but again this yellow can move to green if we work
19 together to make sure that we have solid roaming and
20 priority model setup, and that's something that I'm
21 here to let you know based on what I've been directed
22 to tell you we're here to work with you to help you
23 with that, but they have to be incident based models,
24 they can't be application based models, okay?

25 Next page is early deployments. This can

1 quickly move, you know, over to aqua, based on what
2 Jamie said earlier, to the extent that we can get
3 these early deployments out. Short answer is I've
4 done two early deployments, and we learned a lot from
5 those. And it's hard, certainly there's risk, but
6 I'll tell you the reward is great. So as soon as we
7 can get to these early deployments you'll inspire
8 industry, you inspire device manufacturers, you
9 inspire use, you actually improve your operations
10 procedures and requirements. And oh by the way,
11 because this is an evolutionary process, this is where
12 we need to start that evolutionary process today, not
13 tomorrow, today. So to the extent that we can move
14 that forward, it's great.

15 Now, on the issue of governance, you know,
16 nobody can really argue with what you said with ERIC,
17 they're all the right words, there's no question about
18 it. It's just I think the leaders want to meet ERIC.
19 You know, I know, Jennifer, you were going to
20 introduce us to your husband, but we want to meet
21 ERIC, you know, and know that ERIC has the right
22 people quite frankly and the right positions to make
23 sure that everything you said you want to do with ERIC
24 can be done, that's as simple as that. So once we get
25 past that, I'm sure we can move that over to green.

1 Now, on full multimedia applications, you
2 know, the short answer is, a lot of applications, a
3 lot of the things I've heard so far, even in the New
4 York report, are kind of present day thinking. Well,
5 think about it, we're making a spectrum decision
6 allocation decision that might last ten years, so we
7 have to choose solutions that are beyond our current
8 thinking. So much of this is focused on what we do
9 today and what the carriers allow us, quite frankly,
10 to do today.

11 But take for example, as soon as these
12 firefighters are able to have helmet cams and those
13 guys can go in there with helmet cams and send back,
14 can both download and upload video from inside a
15 building, they're going to want to do that. When I
16 was putting in the first 700 MHZ network in 2004, the
17 first thing the bomb squad said to me is, we want to
18 use this for our robot, because we don't like standing
19 100 feet from our robot driving it around, we'd like
20 to be on the other side of town just like you guys.
21 Well, you know.

22 You know, and then when I talk about drones
23 and things like that, I mean when these guys get their
24 hands on these tools, we should make sure that they
25 have a reliable network that'll be able to -- make

1 sure that we can meet that demand in the future. I'm
2 not going to go into this chart, it's kind of self
3 explanatory, it's the architecture chart, we've talked
4 about in great level of detail, but it's something
5 that we share the vision of.

6 The next chart here is in a cost model.
7 Keep in mind as you guys have been talking about the
8 basis of this, you know, we actually in state and
9 local jurisdictions have to really really justify
10 investments, especially today. So going through this
11 very simple cost model will drive whether we use a
12 commercial network or will drive to use our own
13 network. And the thing about it is the basis of this
14 is to not assume that one size fits all. And that the
15 plan already provides for flexibility but this cost
16 model will drive a lot of what you said earlier, but I
17 really have no objections the way you've done the
18 budgetary number quite frankly, so this is just to
19 help with that.

20 Now, this process chart I'll end on very
21 quickly. There's a lot of work that I tell you from
22 personal experience that needs to be done before you
23 launch a network, and so this was put in here, APCO
24 asked me to put together some training, I did that for
25 them, to try to prepare the APCO membership on getting

1 ready for broadband. That was done actually a year
2 ago, and it really was set up to give you a sense of
3 the types of things that you need to do in order to
4 make the decision of which way to go in the cost model
5 I just showed.

6 So I've provided this before and hopefully
7 it'll be beneficial to you. Now, in the last 40
8 seconds I want to reiterate a couple of things. The
9 plan I workable, we really do believe it's a workable
10 plan, it shows a lot of progress, we're excited about
11 it. Obviously I've identified some things that need
12 to be worked on. We want to partner with you on those
13 things, and especially we want to partner with you on
14 funding, because as the President stated, I am so
15 happy he has said that, void of funding we will not be
16 able to properly serve our citizens. So thank you for
17 your time, and it's yours.

18 MR. KNAPP: Thank you, Robert. Patrick?

19 MR. RINGQVIST: Thank you very much. So I
20 am very pleased to be here today and hear, see the
21 focus of the mobile broadband technology for public
22 safety. So I'm representing Ericsson here, and in our
23 mind LTE is the choice for the next generation mobile
24 broadband technology, not just for commercial
25 operators but also for public safety. So I will just

1 today talk a little bit about some of the key features
2 of LTE that we see and how it relates to public
3 safety.

4 So let me first start off with reiterating
5 that LTE is a global standard, as you all know. It is
6 adopted by mobile operators worldwide, it is being
7 launched this year worldwide, and this creates a
8 global economy of scale that attracts numerous device
9 developers, application developers, and service
10 developers. And therefore we have a very rich
11 ecosystem of developers for commercial operators, and
12 this is something that public safety also can tap into
13 and share by adopting LTE.

14 LTE is a global standard, and as a standards
15 based technology it supports interoperability and
16 ensures interoperability. Interoperability is built
17 in from ground up in LTE by adopting open standards.
18 And we know interoperability is one of the key
19 features that public safety requires, so by adopting
20 LTE you will have that. An important aspect of
21 interoperability is roaming, both from a national
22 point of view but also from a global point of view.

23 And as we can see in the National Broadband
24 Plan, roaming is a key feature to help public safety,
25 not just in coverage but also with capacity. LTE is a

1 true IP based mobile broadband technology. It
2 supports high broadband speeds with wide coverage.
3 The standards is designed today to support up to 150
4 megabits per second peak speeds, and we have seen
5 those in trials already today. It uses a very
6 spectral efficient technology and also a very power
7 efficient range of technology, and this enable
8 handheld and other form factors or devices that are
9 desirable by public safety.

10 LTE has a very low latency or delay on the
11 radio interface. This is a key feature to enable real
12 time services. So it's not just for data services,
13 but also for video communication, voice communication,
14 and other real time multimedia services. And to
15 provide the multimedia services LTE is complemented by
16 IMS, the IP multimedia subsystem that is defined by 3G
17 PP. We see IMS as an important part of any next
18 generation mobile broadband network, and we would like
19 to continue the dialogue with public safety on how to
20 deploy IMS to support these type of services.

21 LTE is an always-on technology. What we
22 mean by this is that the user is automatically
23 authenticated and connected to the network and to the
24 services that they so want to use. And so when they
25 invoke service there is no connection delay because

1 you're already connected. All of these and many other
2 features is what makes LTE the preferred choice for
3 mobile broadband technology and also the right choice
4 for public safety.

5 The network that is built using LTE
6 technology can meet the requirements of public safety
7 as they for example are expressed by the NPSTC
8 Broadband Task Force group that delivered their report
9 last year. We believe that an LTE based public
10 network can provide a wide area coverage and with the
11 speeds meeting the needs of public safety. Using the
12 broadband spectrum allocation 5 plus 5 MHZ, you can
13 build a network that can support peak speeds in excess
14 of 30 megabit per second with an average throughput of
15 7 to 8 megabits per second in the cell site, and this
16 certainly meets the needs of public safety in our
17 minds.

18 Now, evolution doesn't stop here though. As
19 any standards based technology, evolution continues.
20 So what I'm talking about now is the first general LTE
21 that is being deployed this year. Already now there
22 is work going on in standards body, 3G PP in
23 particular that is the standards body for LTE, on
24 advancements in how to improve the performance of LTE,
25 and many of those improvements are of interest also

1 for public safety.

2 One such example is the relay. A relay is a
3 unit that you can place in an area where you have poor
4 coverage, and it improves coverage in that area by
5 relaying the signal from the broader cell into that
6 area. This is a little bit different than the normal
7 repeater because it is coordinated with the
8 macronetwork so you can have a better coordination of
9 handovers and other things.

10 Now the improvement that's also being worked
11 on is something called coordinated multipoint
12 reception. What this is, is a technology that is
13 intended to improve performance at cell edge. It does
14 this by avoiding some of the interference limitations
15 that you have at the cell edge. So both of these
16 examples, and many others, are now being evaluated and
17 explored in the standards bodies, and they're targeted
18 for being standardized by the end of next year and
19 being available commercially 2012.

20 Lastly, I want to say a few words about
21 priority services. We heard a lot here today about
22 that priority and preemption are important for public
23 safety, and we have known that for quite some time.
24 LTE has a rich set of quality of service capabilities,
25 and these capabilities, they enable LTE to meet the

1 needs of public safety in this regard, enabling public
2 safety to differentiate between different services and
3 different users, thereby establishing the hierarchy of
4 admirals before generals et cetera.

5 What happens now if a public safety user
6 roams to a commercial network? Well, in the 2G
7 networks of today, we have the wireless priority
8 service WPS for voice networks, so that is of course
9 available for the traditional 2G networks. Activity
10 is now ongoing to take that same type of principles
11 and standardize it on an LTE network. This is ongoing
12 in 3G PP as well as the next generation Getz forum
13 here in U.S., and they are coordinated.

14 So through these new standards, the same
15 type of service concepts can be transformed and moved
16 into a packet network, and thereby extend priority
17 access from voice to also include data sessions and
18 multimedia services. And unlike today's WPS where you
19 have to dial a long access code to get access to the
20 voice service, you can also have other capabilities on
21 how you set the priorities. They can for example be
22 set up so that you're authorized for the service right
23 when you connect to the network for a particular
24 service. In this way, the WPS service can be much
25 more seamless for the user.

1 Since LTE is also a package service, the way
2 the priority is done is different than in the
3 traditional circuits switched 2G networks. So you
4 apply the prioritization on each packet, not only at
5 the establishing of connection, and thereby you can in
6 real time have a much better flexibility in how you
7 handle priority. So in conclusion, we believe that
8 LTE is the next generation mobile broadband
9 technology, and it is launched right now by operators
10 worldwide. We also think that it is the right choice
11 for public safety and that public safety by deploying
12 LTE will have a rich set of multimedia and data
13 services with a rich set of devices available to them.
14 Thank you very much.

15 MR. KNAPP: Thank you, Patrick. And for the
16 record, all of our speakers have done a fabulous job
17 of staying under ten minutes, thank you all for that,
18 so let's just keep it going. Roger, you're up next.

19 MR. QUAYLE: Thank you. There has been a
20 lot of discussion about LTE devices for the 700 MHZ
21 band covering the public safety and D block, which is
22 band class 14 and 3G PP. So the Commission has asked
23 me to speak about the 3G PP band classes and the
24 support of the various different allocations in the
25 700 MHZ band, and also generally about the public

1 safety device requirements. And also, Stagg and
2 others have mentioned the various options that exist
3 for improving coverage for public safety in rural
4 areas, so I'll be speaking about that as well.

5 If we look at LTE, as Patrick said, it is
6 truly an international standard. That of course means
7 that the technology needs to be standardized to cover
8 a wide range of bands in countries internationally,
9 and ideally a user device should be able to support as
10 many of these bands as possible to facilitate very
11 wide international roaming, and we are starting to see
12 that now on 3G phones, which can now roam between the
13 networks in the U.S. and Europe and also now more
14 recently into countries like Japan which have
15 traditionally had different frequency bands.

16 The issue this creates for the device
17 manufacturers, if you look at the chart you'll see
18 that there are in total about 30 or more different
19 bands that a device has to support for international
20 roaming. You'll see a very wide range of FDD, or
21 frequency division duplex, bands for LTE, both FDD and
22 TDD. And then also a device needs to support up to
23 seven or even eight, nine, or ten UMTS and GSM edge
24 bands for international roaming. So it's not so much
25 a technical issue, it really comes down to a practical

1 and commercial issue as to how many bands a
2 manufacturer wants to put into a user device.

3 So if we look at the 700 MHZ band, and
4 you'll see band 14 at the top, which is the
5 combination of the public safety allocation and the D
6 block, you'll see that the current mainstream device
7 vendors are supporting band 17 and band 13 because
8 they have to date made their choice to limit the
9 number of bands they're covering, not so much because
10 of just 700 MHZ but because of all the other bands
11 that they need to cover.

12 So there is an issue currently with the
13 devices from mainstream vendors covering the public
14 safety allocation. IP Wireless has a device, a really
15 7 3G PP device that's FCC approved that does cover the
16 whole band, and I'll describe on the next slide how we
17 achieve that. The LTE standards define user devices
18 as being able to operate in either full duplex FDD
19 mode or half duplex FDD mode. The main difference in
20 performance is the peak rate that a user can sustain.

21 However, in a loaded network we're more
22 concerned about the average throughput that a user
23 sees and not the peak, and in that respect there's
24 very little difference between full duplex FDD and
25 half duplex FDD. So one option a device manufacturer

1 has is to use half duplex FDD, in which case there's
2 really no issue in covering the entire 700 MHZ band in
3 a device.

4 For full duplex FDD, separate duplex filters
5 are required for each of the bands. So if we look at
6 the lower part of the band, band 14 and band 17, it is
7 possible to have a filter that covers band 12, which
8 then incorporates band 17. We believe the reason that
9 vendors have not done this so far is to protect
10 against adjacent channel blocking from media flow
11 which is in the middle of the lower band, and also UHF
12 television which is down in the 600 MHZ region
13 immediately below the 700 MHZ band.

14 Then in the upper band, it would be
15 technically possible to have a duplex filter that
16 covers band 13 and band 14. However, the issue is
17 that if you look at the upper end of the lower part of
18 band 14 and the bottom end of the upper part of band
19 13, there's a very small duplex gap, which makes it
20 more challenging for the filter developer. It's not
21 to say it's not impossible, it's really a tradeoff
22 between the overall size and cost of the filter.

23 So band 14, as I said, is not covered
24 currently by the commercial UE vendors, and as I said
25 it's really not a technical issue. With full duplex

1 FDD UEs, they do have to make tradeoffs and choose a
2 subset of the bands that they're going to support.
3 However, while we're all disappointed that public
4 safety may not get the D block, one of the sort of
5 compensating benefits if the D block becomes a
6 commercial band is that it will ensure that there are
7 commercial devices that cover band 14, which then
8 solves the band coverage issue for public safety
9 mobile broadband.

10 Looking at devices, one of the benefits of
11 LTE that Patrick has touched on is the economies of
12 scale of public safety being able to take advantage of
13 the huge volume ecosystem for LTE which is going to go
14 into tens of millions and potentially billions of
15 devices ultimately when it gets embedded in the 3G PP
16 operator ecosystem. That is clearly true for the
17 components such as the base band chipsets and the RF
18 chipsets, and it's true for standard commercial user
19 devices, like for example a PCI express minicard which
20 is embedded in a variety of devices, or a USB stick.

21 However, what we see from our experience in
22 public safety, for example with the NYS1 network in
23 New York, is that public safety do have unique device
24 requirements. One thing that's often overlooked is
25 the temperature range of the device. You can have a

1 UE and a router in the trunk of a police car that on
2 the east coast or the northeast might be in the
3 precinct parking lot overnight in very negative
4 temperatures, and then it might be in Nevada in the
5 peak of summer. That device has to stand a much wider
6 temperature range than commercial devices.

7 In terms of form factor, there are special
8 devices required such as rugged routers, LTE UEs
9 embedded in rugged tablet PCs, rugged PDAs, and so on.
10 Commercial smartphones for the public safety 700 MHz
11 band such as the iPhone and Android, this is really
12 dependent on the commercial operators supporting band
13 14, because these volume handsets require large volume
14 even to produce a variant for a particular frequency
15 band.

16 So I know I'm short of time. Moving on to
17 rural coverage with LTE. The commercial networks in
18 rural areas are typically designed for in-car
19 coverage, for example a smartphone in a vehicle. For
20 public safety, there's a major coverage increase that
21 can be had simply by going to vehicle rooftop antennas
22 and getting a combination of removing the vehicle
23 penetration loss and getting an increase in antenna
24 gain.

25 So if we look at the following chart, this

1 is just indicative for a rural area, and what you'll
2 see is the first circle, the red circle, is a
3 smartphone inside a vehicle. We then go to a
4 smartphone outdoors, and then we go to a vehicle
5 rooftop antenna, you can see how coverage
6 progressively increases, and then ultimately to an
7 option which doesn't yet exist in 3G PP power classes,
8 to go to a 1 watt, or 30 DBM, UE.

9 Likewise, if you look at a handheld device,
10 a typical smartphone has internal antennas which 700
11 MHZ will have unity, or zero gain, at best. Simply by
12 going to a rubber ducky style antenna on a rugged
13 public safety handheld device is going to give an
14 increase in coverage. So I'm just about at my time
15 now so we'll finish at that.

16 MR. KNAPP: Thank you, Roger. Mark?

17 MR. MCDIARMID: Very good. Thank you very
18 much, Juli. I just want to take a couple moments to
19 thank the FCC for the opportunity to address the
20 audience today. My name's Mark McDiarmid representing
21 T-Mobile USA. And what I wanted to do today was walk
22 the audience through a couple of slides relating to
23 some of the aspects of let's say commercial asset
24 sharing, and how that works and how it has worked in
25 the past.

1 First, I want to say a couple of things
2 about the idea of sharing infrastructure. Within the
3 commercial operator community it's something that
4 we've done before, and certainly at T-Mobile US we've
5 done it with some of our competitors in the U.S., both
6 on the west coast and in the northeast, where we have
7 shared access networks successfully over major
8 metropolitan areas, but yet retained control over the
9 switching infrastructure and the billing and rating
10 plans that make us ultimately very competitive, and
11 that arrangement had been in place for many years and
12 what very successful for both the parties.

13 So the concept of infrastructure sharing is
14 not new, and within the commercial carrier community
15 is practiced and well understood, certainly in the
16 domain of both 2G and 3G as well. And the question
17 would be, how would that translate to a possible
18 public safety commercial operator arrangement or
19 collaboration to share infrastructure? And there are
20 really sort of four key elements to that that I want
21 to work through.

22 And let me start by addressing the core
23 networks, and in this LTE network architecture, we
24 would assume that the core network would be
25 implemented using the IP multimedia subsystem, or IMS,